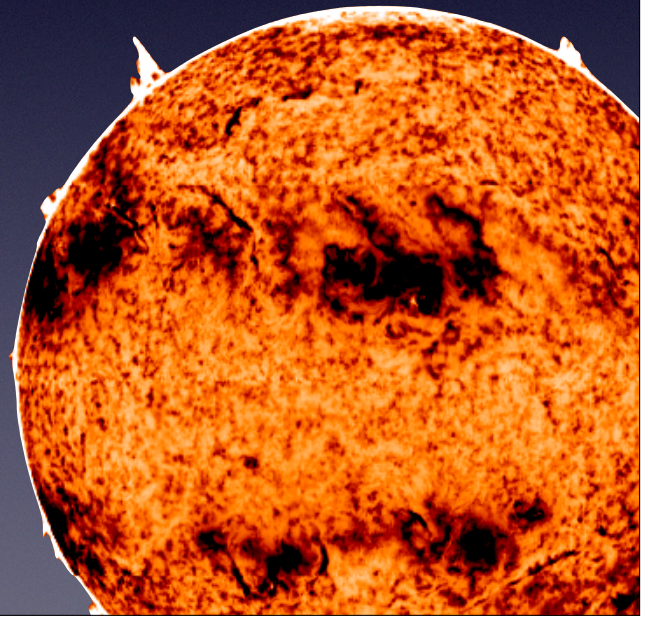
Stars and Stellar Evolution

How do we classify the billions of stars that exist in our galaxy and Universe?

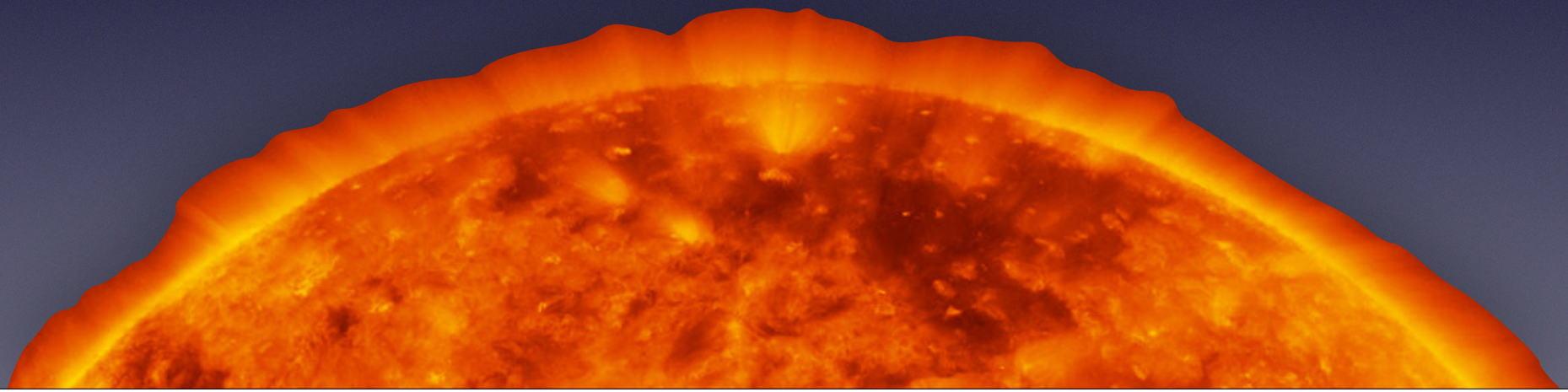
Stars and Stellar Evolution

- Star - sphere of gas held together by gravity that produces tremendous amounts of energy and shines
    - Majority of known matter in the galaxy



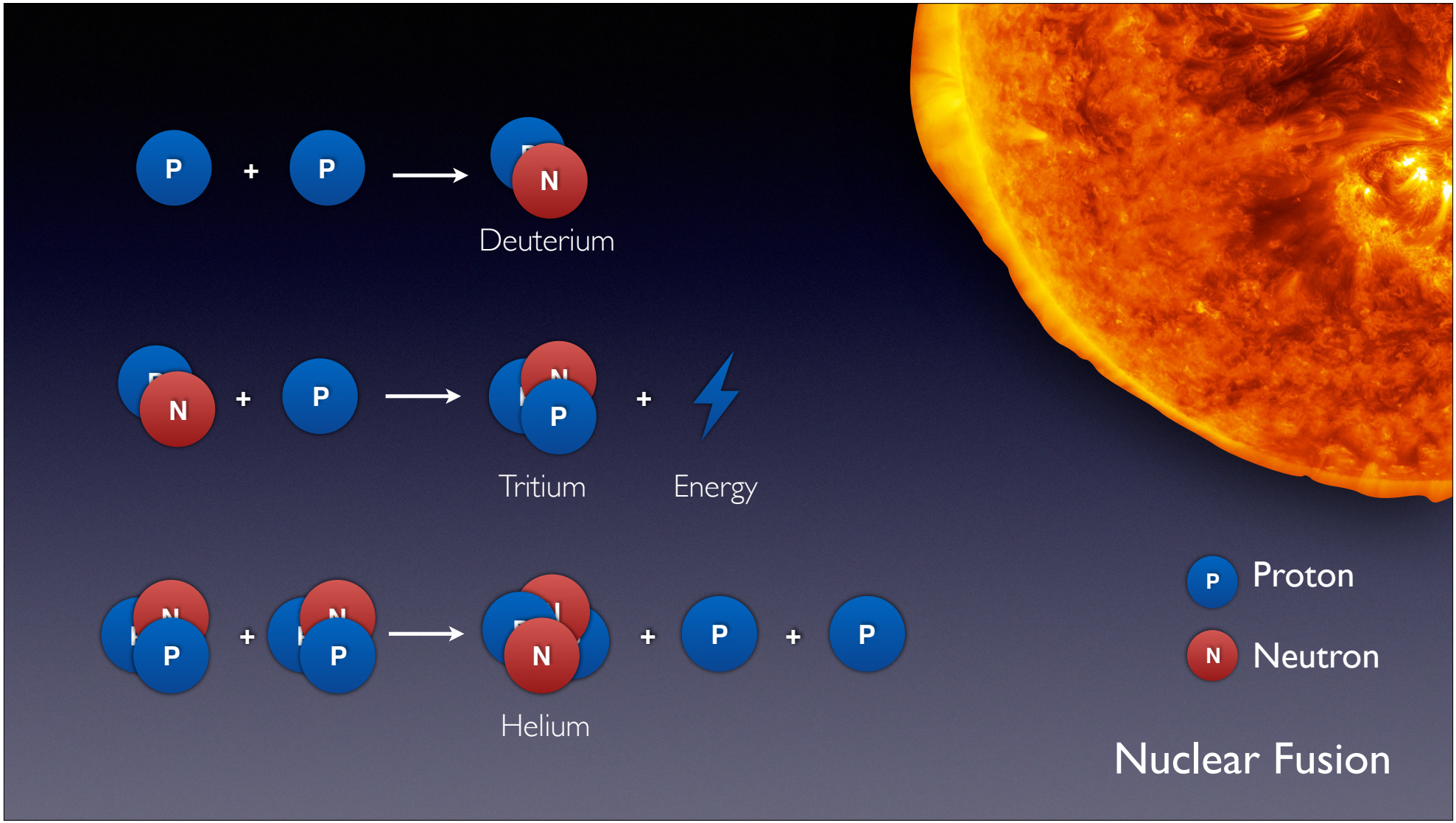
Stars and Stellar Evolution

- Thermonuclear Fusion - a way to achieve nuclear fusion by using extremely high temperatures
  - Manner in which stars create energy



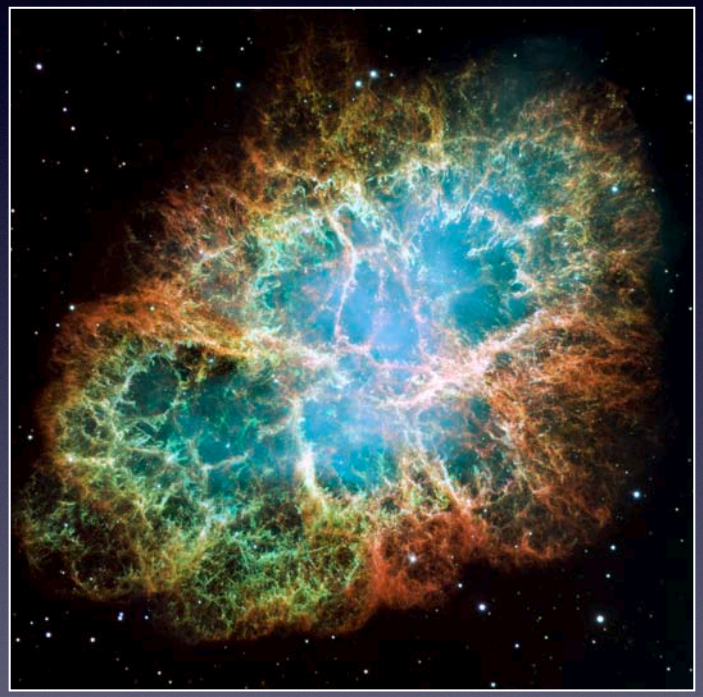
Stars and Stellar Evolution

- Four hydrogen nuclei [each with a mass of about 4.030 mass units] join to form a helium nucleus with a mass of only about 4.003 energy units
- The mass that is lost is converted into energy and radiated into space as light and heat


P
+
P
N
Deuterium
N
+
P
P
+
Tritium
Energy
P
+
P
N
+
P
+
P
Helium
P
Proton
N
Neutron
Nuclear Fusion

Stars and Stellar Evolution

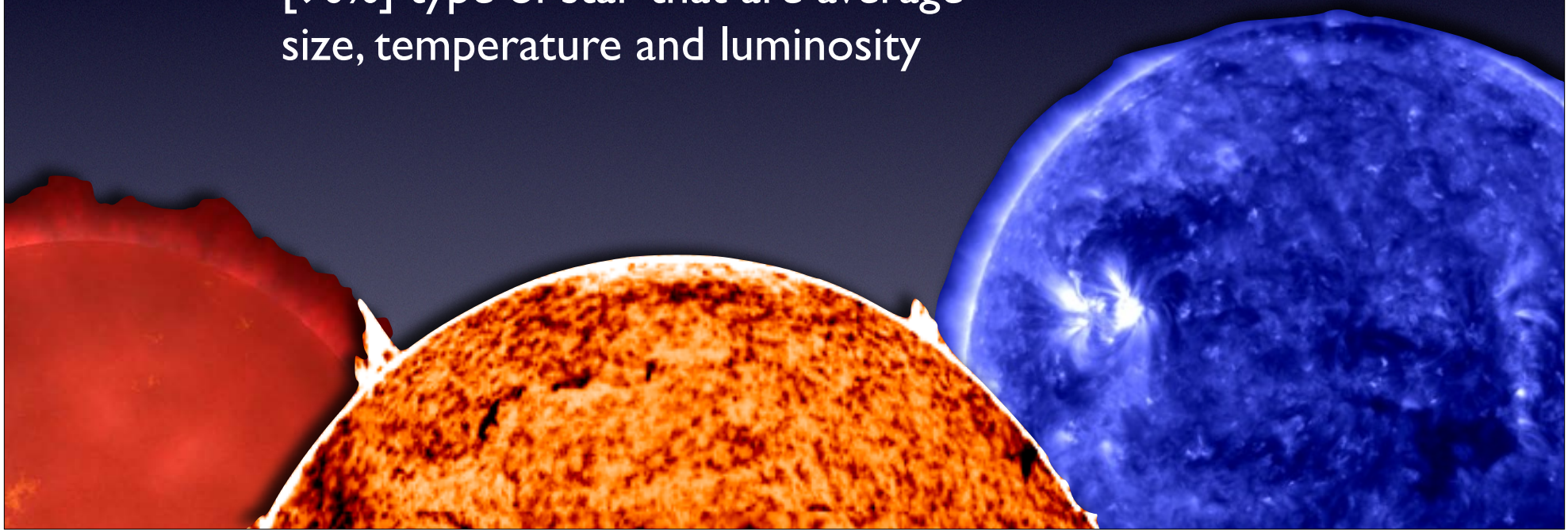
- Types and Parts of Stars:
  - Nebula - a cloud of gas and dust in outer space



Crab Nebula

Stars and Stellar Evolution

- Main Sequence Star - most common [90%] type of star that are average size, temperature and luminosity



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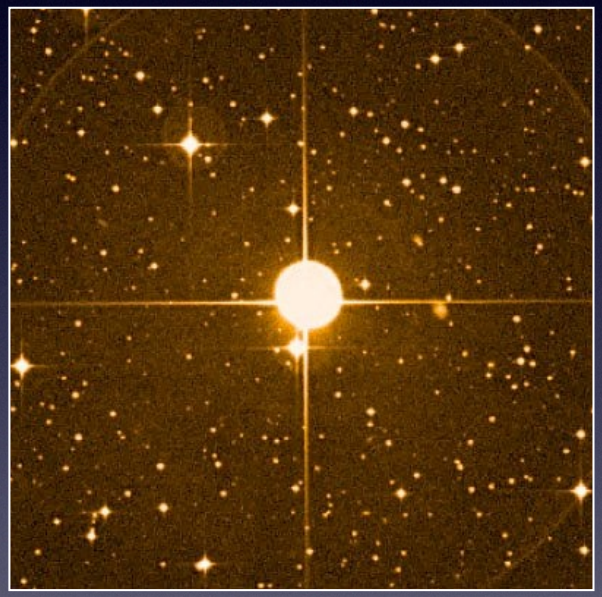
- Red Giant Star - a luminous easily seen star that is in a late phase of stellar evolution



Stars and Stellar Evolution

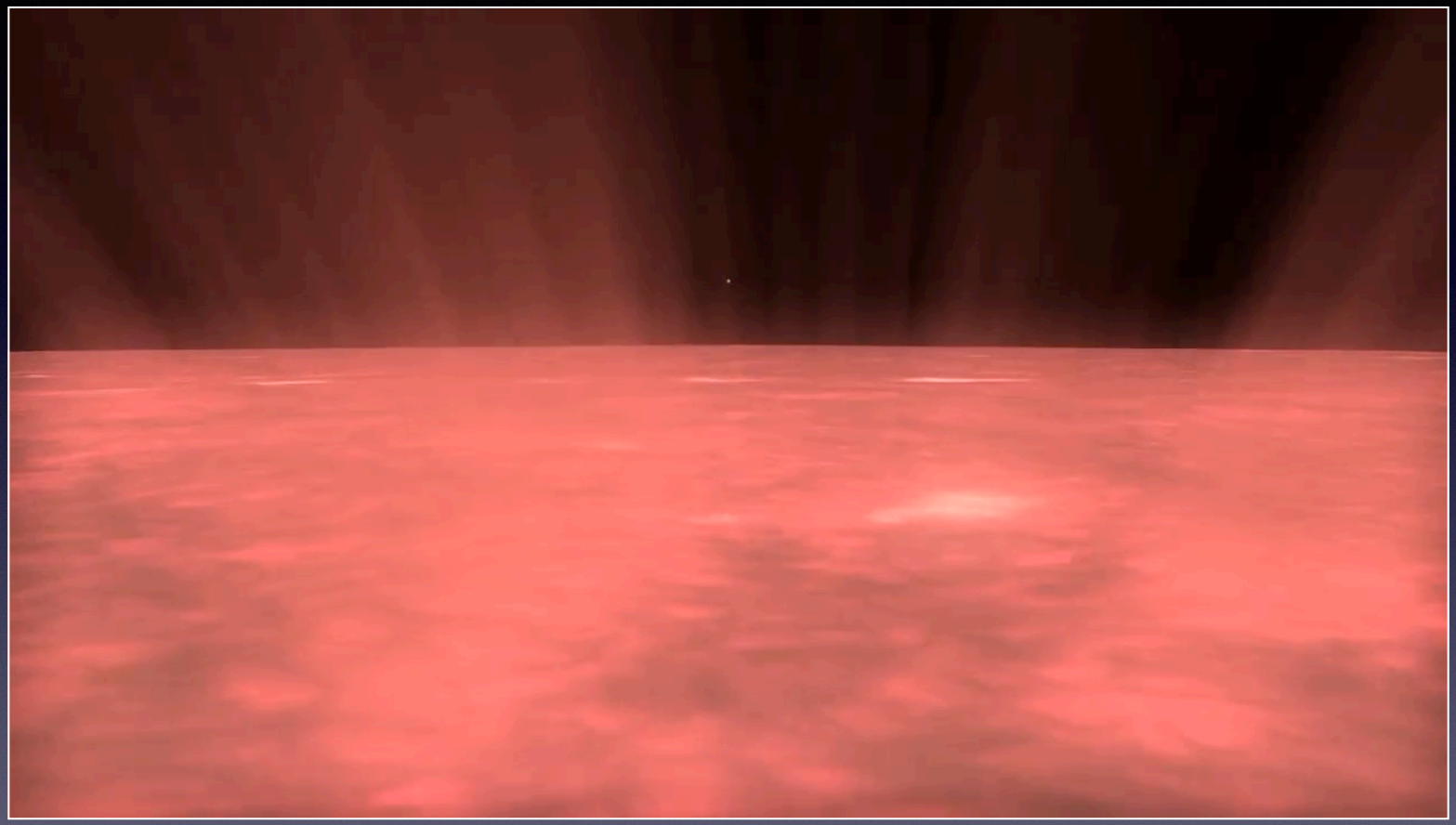
- Super Giant Star - star with an extremely high temperatures in the late stages of its stellar evolution

Stars and Stellar Evolution

- Red Dwarf Star - a small and cool star located on the main sequence

Stars and Stellar Evolution

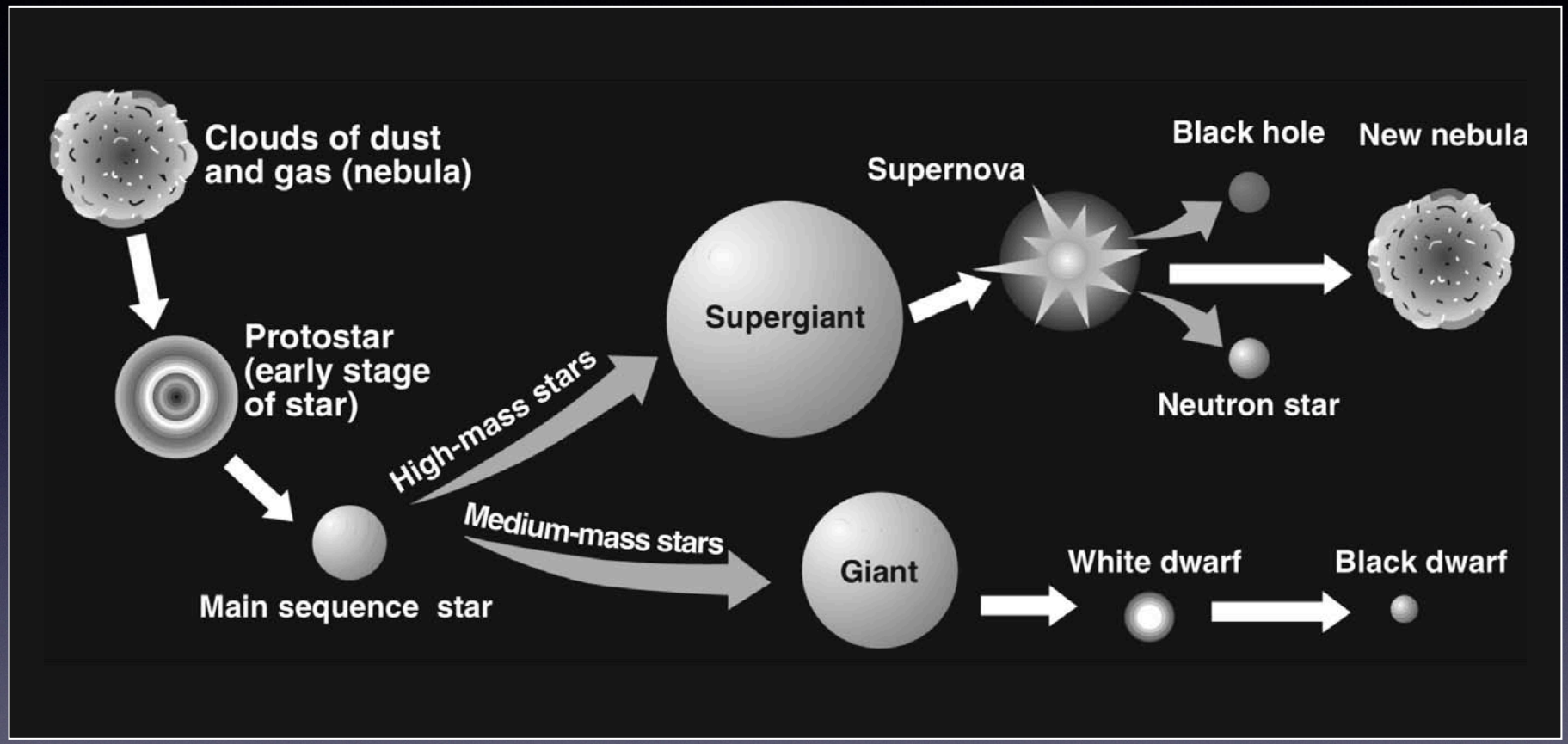
- White Dwarf Star - Earth sized star with a low luminosity and a hot surface



How Big?

Stars and Stellar Evolution

- Stellar Evolution - process by which a star changes over the course of time
  - Dependent on the mass of the star
  - More massive stars have a lifespan of a few million years
  - Less massive stars have and lifespan of trillions of years



Stellar Evolution